

# KNOWLEDGE

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## H HOUSES (part one)

**H**OUSING is facing a crisis. There are about 17 million houses in Great Britain to take care of a population of over 50 million. In these statistics houses are referred to as 'dwelling units' – which means that a large house converted into six flats counts as six houses. Many 'dwelling units' are far from adequate for the three or four people who, on the average, live in them. And more than half of these houses were built before 1919, which means that a great proportion lack modern amenities – proper ventilation, drainage, and perhaps even baths. In fact, in Britain today there are no less than 600,000 families living in slum conditions.

But this is only a fraction of the problem. The population is growing all the time – certain districts are becoming ludicrously overpopulated; many families in the London, Birmingham, and Clydeside areas are *completely* homeless. So there is a drive to build houses, and over the last 10 years the government has built 300,000 houses a year. But against this must be set the fact that only 60,000 slum houses are being pulled down each year, that there are  $\frac{1}{2}$  million slum houses and  $3\frac{1}{2}$  million obsolescent houses still to go, and that by the time they have come down thousands more will also need replacing. *At the present rate it will take 70 years to replace the obsolescent houses built before 1881, and by this time an additional 4 million will be over 100 years old.*

### Rising prices

But surely, one would think, progress is being made. Yet it comes as a shock to realise that in 1939, when there was virtually no housing problem, the government built 358,823 houses – more than they did in 1963! There are many reasons why this has happened; the most important is rising prices. As recently as 1952 a local authority reckoned on spending 28s 0½d on each square foot of land it built houses on. Today this figure has soared to £2. For the buyer this is even more disastrous. House prices went up no less than 11 per cent in 1961 alone. A very ordinary three-bedroomed house in an unfashionable area costs an average of about £3,000, about four times the pre-war figure.

The problem, therefore, is acute. Time alone will tell if and how it will be solved. But now let us have a look at houses, not in terms of national crisis but as they have developed over the centuries in Britain.

### The first houses in Britain

The earliest houses which you are likely to see in Britain date from Roman times. When the Romans arrived in Britain in the 1st century A D they found the Britons living in primitive stone or wooden buildings, designed only to shelter them from the elements and from wild beasts. The Romans brought their own building styles with them, adapting them specially to the colder climate. The Roman house usually faced inwards on to a small courtyard. The floor, which was often covered with beautiful mosaics, was supported by stone piers or *pilae*. These were part

of the very advanced Roman central heating system; hot air from an outside furnace circulated in the *hypocaust* under the floor, and rose through hollow tiles in the walls to warm the rooms. A Roman town house was called a *domus*, and a country house a *villa*; about 500 villas have been discovered, usually, as at Chedworth in Gloucestershire, complete with extensive farm buildings.



*A Roman villa*

### Mediaeval and Tudor

Building in Britain suffered a relapse after the departure of the Roman garrison in the 5th century A D; a relapse which lasted until the arrival of the Normans in the 11th century. The Anglo-Saxons built most of their houses of wood, so virtually none of them has survived; but the Norman Conquest meant a revival of stone building in Britain. The great Norman lords and their retainers lived in massive stone castles from which they controlled the whole countryside.



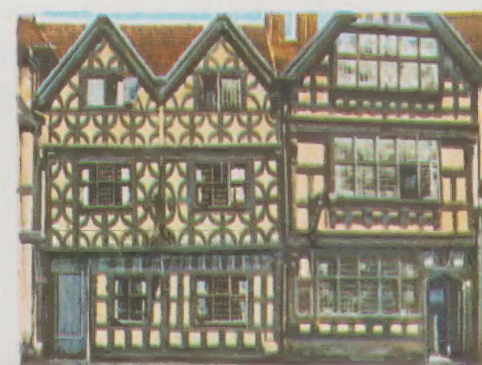
*Norman houses in Lincoln*

Lesser nobles lived in manor houses, and these too were fortified at first. Life in castles and manors centred round the great hall, where people lived, ate, and sometimes even slept. Windows at this stage were very small, both because glass was scarce and because narrow slits were a better defence against arrows.

Houses in mediaeval towns were usually built of plaster and timber, rarely of stone; the Lincoln houses shown above are about the only examples in stone left. They often had two or three storeys, with a shop on the ground floor, and to give more space the upper storeys sometimes juttied out above the street, supported by strong oak beams. These upper storeys were often faced with pointed wooden gables.

The accession of the Tudors brought the Wars of the Roses to an end; the days of the powerful lords with their fortresses and armed supporters were over, and pos-

*Timbered Tudor house*



# H I G H F I N A N C E



*A view of the City of London – one of the centres of world finance (① the Bank of England; ② the Stock Exchange).*

THE dramatic, mysterious world of stocks and shares, of take-over bids, of the Bank of England, discount houses, merchant banks, and of men who are made paupers and millionaires overnight: this is the world of 'high finance'. It is a world in which governments, industries, institutions, and individuals borrow and lend money; and in which merchants trade in vast quantities of goods.

## **The City**

The world of British high finance is centred on the City, a square mile of London which contains most of the important financial institutions: the Bank of England, the Stock Exchange, insurance companies, banks, discount houses, and commodity markets. The whole City is given up to high finance, and no one walking round it can remain in any doubt about this, though the grey stone walls give little indication of the financial ferment behind them.

## **Interest**

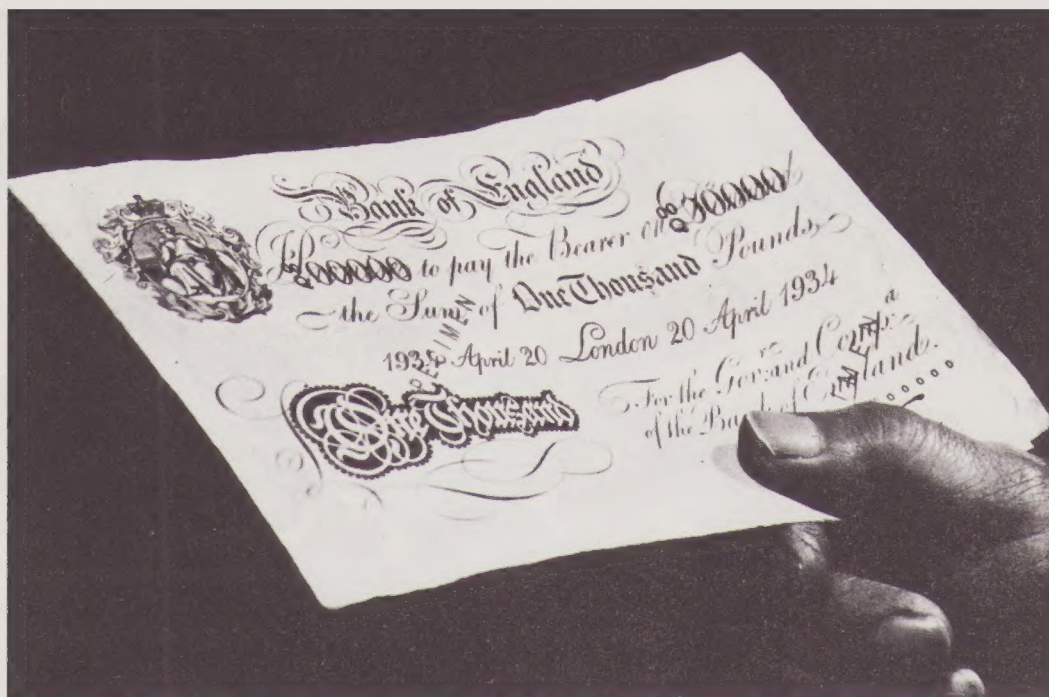
If money is saved it can be lent to someone who can use it profitably. People are prepared to pay money for the convenience of borrowing it; this is known as *interest*. The interest rate is the rate of hire for the loan, and the longer the period of loan the higher the interest payment. Even sums as small as 5s can be lent to the government through a Post Office account, and the government will pay interest for the use of the money. Try it yourself; there are already 22 million active Post Office accounts. Larger sums can be used to buy a share in companies. These companies, being owned by the shareholders, are called public, or joint-stock, companies. When the firm makes a large profit part of it is distributed to the owners of shares, and hence if a company does well, and public demand is greater, the value of these shares goes up.

There is a market in London called the Stock Exchange (see page 1684) where shares are bought and sold. Financiers have made huge personal fortunes by buying shares at low prices, waiting till they rise in value, and then selling them at a profit. The Stock Exchange is a real market, trading in 9,000 different securities with a market value of over £50,000 million. From the Visitors' Gallery high finance can be seen in action. Stockbrokers, who act for their clients, can be seen bargaining for shares with the 'jobbers' who hold them. 'My word is my bond' is the motto of the Stock Exchange, and the only evidence that a deal has taken place between a broker and a jobber consists of the entries that each makes in his notebook. The next day the newspapers will list the prices at which these shares change hands, and some 3 million investors all over the country will be looking to see the value of their holdings.

Of course, it is not only the holders of the shares in companies who are affected by the companies' prosperity. Anyone who has taken out an insurance policy, who has money in a building society, or trustee savings bank, or who has shares in an investment trust, or indeed has a banking account, has indirectly contributed finance for private enterprise. All these bodies invest the money paid into them, and these funds find their way to someone who is waiting to use them profitably.

## **Commodity markets**

It would be wrong to think that only shares in companies are bought and sold in the City. Britain is the traditional centre for marketing many of the world's basic commodities. Among the most important British markets are the Baltic Exchange (the market for shipping and air transport, grain seeds, and vegetable oils), the London Commodity Exchange (cocoa, coffee, copra, hides and skins, rubber, and sugar), the London



*£1,000 note — these notes were issued until 1943.*

Wool Exchange, the London Metal Exchange, the Liverpool Cotton Exchange, and the Liverpool Corn Exchange.

Whatever is traded, there will be speculators trying to make money out of changes in price between buying and selling; this will happen whether it is international currencies or coffee beans that are changing hands. These markets not only cater for the import of goods for home consumption, but also do much business in carrying out transactions between buyers and sellers in other countries.

In addition to these formal markets there is scarcely any product which cannot be traded through an intermediary in Britain. For example, London is the world's most important philatelic (stamp) market and also the leading international centre for the sale of works of art. The London gold market handles an overwhelming proportion of the buying and selling of gold in the world. The market consists of five firms dealing in gold bullion, whose representatives meet on each working day to fix the official London gold price.

### Take-overs

Sometimes one firm will decide to take over another firm by buying some or all of its shares, and thus being in a position of control over it. A company may, by taking over rival companies, achieve a monopoly as the only seller of a particular commodity. The immense size of these take-overs has caught the public imagination. For instance, the unsuccessful £200 million bid in 1962 by Imperial Chemical Industries for Courtaulds occupied the attention of the newspapers for weeks.

### 'I promise to pay ...'

At the heart of the world of high finance is the London Money Market, which trades in short- or long-term debts. To many people this is mysterious, but it need not be. Look at a £1 note. You will see on it the words: 'I promise to pay the Bearer on Demand the sum of One Pound.' It is signed by the Chief Cashier of the Bank of England (acting for the government), and addressed to the holder of the note. Everyone trusts the government to keep its promises, and so everyone is prepared to accept this acknowledgement of a debt as money. But what about the other documents promising to pay a certain sum, or acknowledging a debt?

There are two reasons why they may not be worth their face value. The first is

that the debt may not be payable 'on demand' as the pound note is. The second is, of course, that the debt may not be paid in full, or at all. So these promises to pay or acknowledgements of debts can be bought in the London Money Market at a discount for less money than their face value.

### Bills

One way in which the government borrows money to carry out its day-to-day business is by writing out promises to pay sums of money at future dates, usually 91 days ahead. It then sells these 'Treasury Bills' at a discount to the various institutions in the London Money Market, who are glad to invest their funds in this way. Banks, insurance companies, and other bodies buy these bills. Among the chief buyers are the 'discount houses'. They make their profits by competing to buy bills at a discount, and then either waiting until the government pays the full face value three months later, or reselling the bills at a slight profit to any buyer.

But the government is not alone in raising money on bills. 'Trade Bills' are also bought on the London Money Market. Consider the following way in which the Market can help to finance trade between two people: a merchant A, and a customer B, who perhaps live in different countries. B does not want to pay for his goods until he gets them, but A wants his money as soon as he sends the goods off. So the London Money Market fills the gap. First B signs a bill promising to pay for the goods when they arrive. Then someone is found who will accept B's promise. Now merchant banks

*These messengers in traditional costume can be seen every working day outside the imposing façade of the Bank of England in Threadneedle Street*





*The Stock Exchange – fortunes are made and lost*

in London make it their business to know about the reliability of traders, all over the world, with whom they have contact. So a merchant bank, acting as an 'accepting house', guarantees the payment, in return for a commission from A. This guarantee A sells for immediate cash on the London Money Market – probably to a discount house. So all parties to the deal are satisfied.

organisations could manage to meet all their financial obligations at once – certainly not ordinary commercial banks who just do not have the money credited to people in their accounts. In fact, the total liabilities of a big bank are roughly  $12\frac{1}{2}$  times what they really have in hard cash at any moment. So big money is often not what you have, but what people are prepared to credit you with having.

### Gold standard

The bank notes' 'promise to pay' does not mean quite what it seems to. Fifty years ago almost every country in the world was on the gold standard. That is, notes were issued by banks in exact proportion to the national gold reserves, and thus a note really could be cashed in gold. But this meant that the governments could only exercise a restricted control over the note issue.

Today this is no longer so, and most governments control note issues for three reasons. First, because they have felt it increasingly politically desirable to control the nation's note issue; secondly, because an increased issue of notes could result in rising prices or inflation at home; and thirdly, price rises at home might weaken a country's foreign trading position, as its currency will tend to depreciate in value. An uncontrolled issue of pound notes would mean, for instance, that the pound sterling might be worth fewer and fewer francs; in other words, a given number of French francs would be able to buy an increasing number of English pounds; similarly, the pound sterling would be able to buy less French francs.

### The function of credit

One of the conclusions that one draws from all this is that there are two kinds of money assets. The first consists of one's own money; the second consists of money hired from a creditor for some period of time.

By obtaining money on credit, extra opportunities for making profits can be realised. Most expanding companies have large *overdrafts* – debts to their banks – and they use the credit obtained in this way to make profits. They hope that these profits will more than cover the interest payment – hire charge – which they pay to the creditors. The whole world of high finance is thus bound up with supplying money on credit.

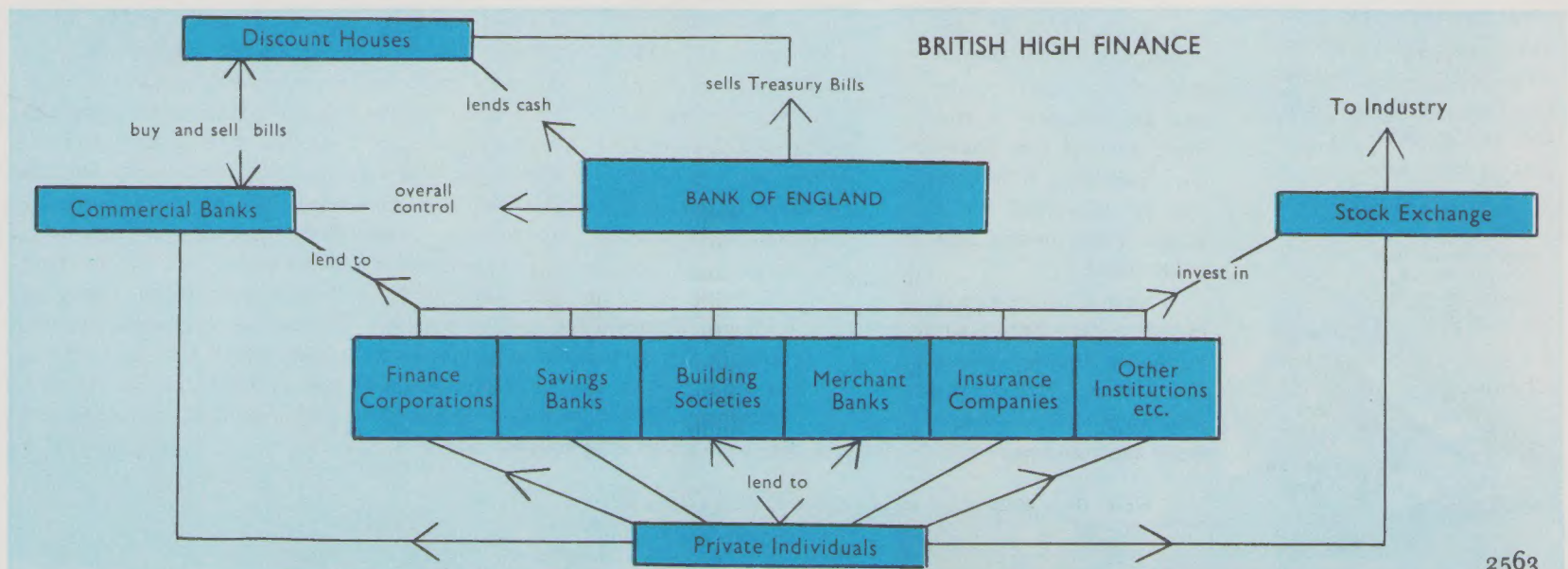
### 'Crashes' and 'slumps'

It has been pointed out that a market in credit depends on the confidence of the creditor that the safety of his money is guaranteed. The word 'credit' in fact comes from the Latin, *credere*, to believe or trust. If the basis of confidence crumbles, there may be trouble. There may be a 'crash' or 'slump' in the value of the shares of a company, or a financier may be declared bankrupt. In high finance confidence in a company or an individual is a very nebulous thing. Few individuals or

### World of high finance

There are many other institutions in the London money market, that have not so far been mentioned, which fulfil specialised functions in the supply of credit. Examples are the Finance Corporation for Industry, the Industrial and Commercial Finance Corporation, the Commonwealth Development Finance Corporation, and the Agricultural Mortgage Corporation. They compete to make profits for themselves, as do the clearing banks, the merchant banks, the overseas banks, the hire purchase companies, and insurance companies. At the same time they provide one of the world's finest markets, linking borrowers and lenders of money.

Britain deserves her international reputation for high finance, but there are other great centres for high finance, of course. There is Wall Street in New York; the Bourse in Paris; the stock exchanges in Milan, Johannesburg, and Tokyo. Throughout the world thousands of millions of pounds change hands each week; fortunes are made, reputations lost, and the economic destiny of nations decided. This is the world of high finance.



# V I P E R S

IN Britain there are only three species of snakes, of which only one, the adder, is poisonous. This small brown reptile, with a black zigzag stripe along its back, is a member of the Family Viperidae. It is most commonly found on open moorland and occurs throughout Great Britain, but not in Ireland. It is widely distributed in Europe and northern Asia, and can endure a colder climate than any other snake, even living north of the Arctic Circle in Scandinavia.

## Two groups of vipers

The vipers are divided into two distinct groups or Sub-families, the Viperinae and the Crotalinae. The Viperinae, often called the true vipers, include all the European and African and most of the Asiatic species; they are not found in North or South America. The Crotalinae or pit vipers occur in great variety in the Americas, and there are a few of them in eastern Asia. The rattlesnakes (see page 1779) are the most familiar of the pit vipers, and the bushmaster (*Lachesis mutus*) of tropical America is the largest of all vipers, reaching a length of 12 feet. No vipers of any kind are found in either Australia or New Zealand.

The pit vipers are so called because they have a deep hole or pit on each side of the head between the eye and nostril. It has been shown that this is a *thermosensitive* organ; that is, it is sensitive to small amounts of radiant heat. This enables these snakes to detect warm-blooded prey, such as mice and birds, in complete darkness. Since there is a pit on each side of the head the pit viper can guide itself towards the victim and locate it accurately.



The asp viper (*Vipera aspis*) of southern Europe. These snakes prey on small rodents

## Where and how they live

Most vipers are ground snakes, though a few species climb among trees and bushes. These are generally coloured green, so that they are concealed among the leaves both from their enemies and from their prey. The ground-living kinds are usually brown, with a pattern of markings

### CHARACTERISTICS

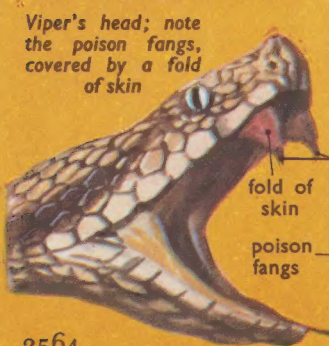
All vipers are venomous, and the bite of some species can kill a man. They are usually inclined to be sluggish, and this means that people often tread on them by accident. Some of them give a warning by hissing loudly when approached or, as in the rattlesnakes, by vibrating their tails.



Skull of a viper

The two poison fangs (see page 1777) of the vipers are much longer than their other teeth, and are situated in the front part of the upper jaw. Each one is hollow and is connected to a poison gland in the side of the head.

When the snake's mouth is closed the fangs lie back, pointing down the throat. When the jaws open they move forward and stand up.



Viper's head; note the poison fangs, covered by a fold of skin

fold of skin  
poison fangs

### CLASSIFICATION OF THE VIPERS

The vipers make up a very distinct Family (Viperidae) of the snakes. Snakes and lizards are classified together in the Order Squamata, which is a sub-division of the Class Reptilia or reptiles.

### THE VENOM

The venom or poison of vipers varies greatly in its effect on man. That of the adder seldom causes death to an adult. However, the amount of venom injected may be enough to kill a small child – this is because the amount of venom injected is large when related to the size of its victim. On the other hand some of the tropical vipers are among the most dangerous of all snakes. This is partly because their venom is very powerful, and partly because they will not move out of the way when someone approaches – indeed, when trodden on they bite.

The venom of the Elapid snakes, such as the cobra (see page 1778), is a *neurotoxic* poison, acting on the nervous system and causing paralysis. That of the vipers acts to some extent in this way, but is mainly *haemotoxic* in its effect; that is, it attacks and breaks down the small blood vessels and destroys the blood itself. Death from the bite of a viper is less rapid than from that of a cobra, and may even occur after several days.

Note: these illustrations are not drawn to the same scale



that breaks up the outline of the snake and makes an effective camouflage. The Gaboon viper (see below, right) is a good example of this. Ground vipers are found in all kinds of country, some species inhabiting forest, others savannah or sandy desert.

Vipers feed on small animals, and many of them prefer mammals such as rats and mice. When such a victim is struck by a viper the long fangs penetrate deep into its body and it dies almost immediately. Some kinds of vipers lay eggs, but most of the species bear their young alive. The puff adder may have as many as 70 young at a time, but the common adder has only from 6 to 20.

#### ENEMIES OF THE ADDER

Although it is a formidable creature the adder has its enemies. Hedgehogs will readily attack and eat one. When the snake strikes a hedgehog in self-defence it almost always impales its head on the spines and its fangs fail to penetrate the hedgehog's skin, while even if it does manage to bite, the hedgehog has a natural immunity to the venom. Some birds of prey habitually kill and eat snakes regardless of whether they are poisonous or not, and cases are also known of pheasants attacking them. A cat can safely attack and kill an adder as its movements are far quicker.



#### VIPERS FOUND IN EUROPE

The asp viper (left) and several other species occur in Europe, most of them in the southern part of the continent.

**ADDER** (*Vipera berus*). This is the only viper found in Britain, and on the European continent it extends farther north than any other snake; it is also found at a height of nearly 10,000 feet in the Alps.



adder

sand viper



**SAND VIPER** (*Vipera ammodytes*). This snake has a little scaly horn on its nose; it is found in southern Europe.

#### VIPERS OF REGIONS OUTSIDE EUROPE

Four African vipers are shown below. There is a picture of the rattlesnake, an American pit viper, on page 1779.

**HORNED ASP** (*Cerastes cerastes*). This snake has a pair of enlarged scales that form a horn-like prominence over each eye. It is found in the desert region of North Africa.



horned asp

puff adder

**PUFF ADDER** (*Bitis arietans*). This large, stout viper is distributed over most of Africa. It gives warning by hissing loudly when approached.



African tree viper

**AFRICAN TREE VIPER** (*Atheris chlorechis*). This is one of the few species of viper that live among trees.

**GABOON VIPER** (*Bitis gabonica*). Growing to 6 feet, this is the largest of the African vipers; its poison fangs may be 5 inches long.



Gaboon viper

# EUROPE IN THE 14th CENTURY

**T**HE 14th century was confusing, chaotic, and depressing. Right in the middle, in 1348, came the Black Death – the most horrible disaster of human history, which destroyed between one-third and one-half of the entire population of Europe. This unprecedented catastrophe had many consequences. It caused a collapse of moral standards and engendered a feeling of doubt and despondency which was to last for generations; but perhaps more important was that it caused an acute labour shortage, simply by killing off so many workers. The result was that labour became valuable and landowners had to offer good wages to attract workmen. The feudal ideal by which the worker was tied to the soil, ‘paying’ for his land by means of labour services, declined rapidly in practice (though not in theory) in the 14th century as money wages came to replace labour dues. The 14th century was not the beginning of an economy based on money (the process towards such an economy was accelerating even before 1348), but it is nevertheless an important landmark in its development.

## THE PAPACY

In other fields too the 14th century saw a transition from old to new ways; and the birth pangs were often painful. The Papacy, which was, on the whole, respected in the 13th century, went into a rapid decline and ended the century as the laughing-stock of Europe. For in 1309 Pope Clement V moved from Rome to French-controlled Avignon. In doing so he began a long line of French Popes, who were subservient to the interests of France and filled the College of Cardinals with Frenchmen. Of course the rivals of France, like the emperors of Germany, kings of England, and rulers in Italy, could hardly be expected to accept a Papacy so obviously in the pocket of the French king as the authentic voice of Christianity.

And therefore the Papacy, as an international institution, fell into sad disrepute. In 1378 the Pope moved back to

Rome – but the consequences were even worse. For the French set up Clement VII as an anti-Pope at Avignon, while Italy and England supported Pope Urban VI at Rome. This Great Schism, with rival popes hurling abuse and bulls of excommunication at each other, was to last until the Council of Constance in 1414. It is not surprising that reforming movements similar to 16th-century Protestantism were rife; in England such a reformer was the ‘Morning Star of the Reformation’, John Wycliffe; in Bohemia it was John Hus, who was eventually burned as a heretic by order of the Council of Constance.

As war became more elaborate short services were unsatisfactory, and so long-term professional soldiers were employed. Similarly, the nobles employed armed retainers who might have no land at all, and whose relationship to their lords would be on an employer-employee basis. This system, by which feudal allegiance based on land was replaced by personal allegiance to a lord or commander in the field, is known as ‘bastard’ feudalism. One of the consequences of bastard feudalism was the growth of the military power of individual nobles, who began to keep permanent standing armies. In England the nobles grew so powerful that twice in the 14th century, in 1327 and 1399, they were able to overthrow the kings Edward II and Richard II (see page 2385). Yet Edward III was able to make good use of these powerful subjects, for he had their support and used it in the Hundred Years War.

## GROWTH OF NATIONS

With the decline of the Papacy and the growth of the professional paid army, it is not surprising that the 14th century saw a great development of national monarchies. In particular England first and France later developed a remarkable national unity in the course of the Hundred Years War which broke out in 1337 (see page 1981). At the close of the 14th century these two nations were by far the most powerful in Europe. The other nations developed no comparable unity. Italy was divided into numerous small states, the most important of which was Venice, followed by Milan, Florence, Naples, and Genoa. The Spanish kingdoms of Castile and Aragon were to wait nearly 100 years for unification, while Germany too was a ‘geographical expression’. There was no German ‘nationalism’, and the German crown was usually bestowed by the seven Electors (the rulers of Saxony, the Palatinate, Bohemia, Cologne, Brandenburg, Mainz, and Trier, in whose hands lay the election of the German Emperor) on the highest bidder, whether or not he would be good for Germany.

## DECAY OF FEUDALISM

As the economic and religious bases of the high Middle Ages were shaken, so too was the basis of feudal society. The feudal system (see page 2378) had divided people up along territorial lines – a man’s station was governed by how much land he occupied, what service he did for it, and which overlord he held it from. Many of these services were tasks connected with agriculture and were heavy at harvest time; but others were short-term spells in the feudal host or army.

In the 14th century the king and greater lords began to pay money for most of the soldiers in their armies.



## YOU SHOULD NOW KNOW

1. When was the Black Death?
2. Where did the Papacy move to between 1309 and 1378?
3. When was the Council of Constance?
4. Who was the Morning Star of the Reformation?
5. Name the seven Electors.

THE group of plants with the botanical name Leguminosae is often referred to as the 'pea and bean family', as these are the most familiar members of it. But, as we shall see, it includes many other plants besides peas and beans; many of them are herbs, but there are bushes and trees as well. Leguminosae are a valuable source of food for man and animals, and many species of the group are cultivated. They also feed the soil itself, and after their growth it is more fertile and will grow better crops of other plants, such as cereals.

This curious fact was known to the Ancient Romans, and they improved the yield of their fields by growing corn and a leguminous crop in alternate years, but they had no idea how the beans or vetch that they sowed enriched the soil. It was not until the 19th century that the matter was explained.

One of the most important elements needed for the growth of plants (and animals too) is nitrogen, which is the basis of the formation of protein. In the atmosphere there is an inexhaustible supply of nitrogen, since it makes up 78 per cent of the air. But this pure (or uncombined) nitrogen is not normally available to plants, for they can only absorb chemical compounds of nitrogen, such as nitrates, from the soil. But as we shall see, when leguminous plants are grown, atmospheric nitrogen is captured (or 'fixed') and combined with other elements. The resulting compounds are incorporated in the plants' tissues and pass into the soil when they die. But for this, the nitrates in the soil would soon be exhausted.



# LEGUMINOSAE

## BENEFICIAL PARASITES

If you carefully pull up a leguminous plant – for example, a lupin – and examine it, you can see numerous little swellings or *tubercles* on the roots; they look diseased. In a sense they are, for the tubercles are caused by parasitic bacteria. These bacteria, which are called *Rhizobium*, can live only in the tissues of leguminous plants, and, like other parasites, they derive nourishment from their host. In this case the bacteria take sugars, which have been made by photosynthesis in the leaves of the plant. They do not need to take nitrogen compounds, however, because they have the power to combine pure nitrogen from the air with the hydrogen in water, and, from this beginning, to build up the sort of compounds that are needed to form protein. The leguminous plant is able to take advantage of this to absorb some of the nitrogen compounds itself. Both partners therefore – the plant and the bacteria – benefit from the association.

It is now clear how the soil is enriched by the growth of leguminous plants; when they die the nitrogen that was 'fixed' by their beneficent parasites remains in their tissues and passes into the soil when they decay. There are a few other organisms that also fix atmospheric nitrogen; among them are some free-living bacteria and the Cyanophyceae or blue-green algae (see page 2470).

The process of capturing atmospheric nitrogen is now carried out industrially by combining pure nitrogen and hydrogen, under high pressure and temperature, to make ammonia. This, however, is of minor importance compared with the world-wide natural process that is carried out by algae and by bacteria working in partnership with leguminous plants.

Root of a lupin with root tubercles

12,000 SPECIES. The Leguminosae are a very large and successful family of plants – in fact one of the largest in the Vegetable Kingdom. From what we now know of their activities this is a very fortunate thing both for ourselves and for all forms of animal and plant life. About 12,000 species of Leguminosae are known, and these are classified in about 500 different genera.

THE FRUIT. The fruit of the leguminosae is the *legume* or pod containing a number of fairly large seeds arranged in a row. It is of the type called *dehiscent*; that is, it splits open when it is ripe, to release the seeds.

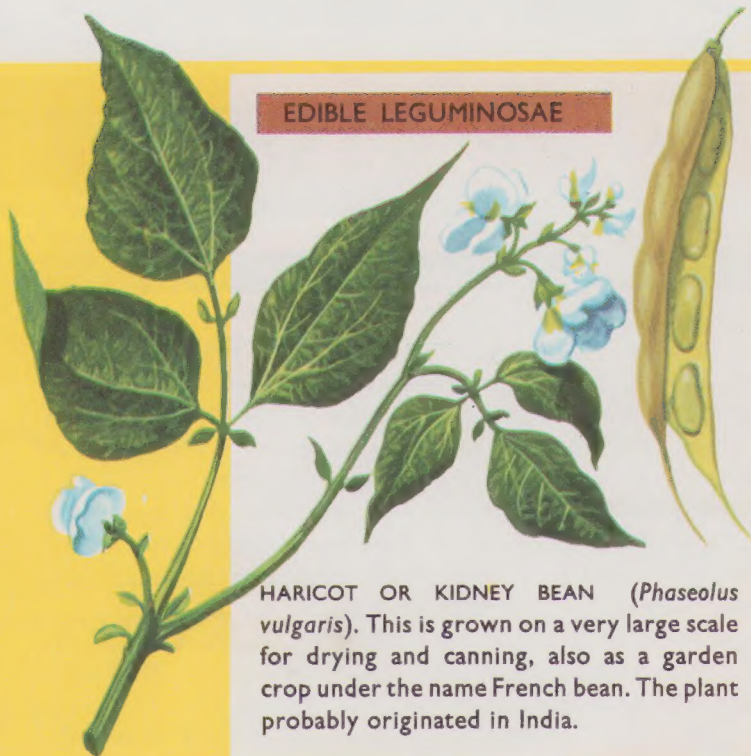
THE FLOWER. The leguminous flower has a characteristic form. The *sepals* are joined to form a sheath-like *calyx*. A large unpaired petal called the *standard* stands at the back of the flower. This is flanked by two side petals called the *wings*, and there is another pair of petals below which are joined along their lower edges and form the *keel*. There are ten *stamens*; usually nine of them are joined together, forming a tube, and one is free. In the tube lies the *pistil*.



## CLASSIFICATION

The Family Leguminosae is divided into three Sub-families: the Caesalpinaceae, the Mimosaceae, and the Papilionaceae. The first two consist of trees, mainly tropical. Nearly all the more familiar members of the Family, such as peas, beans, clovers, and vetches, belong to the Papilionaceae.

## EDIBLE LEGUMINOSAE



**HARICOT OR KIDNEY BEAN** (*Phaseolus vulgaris*). This is grown on a very large scale for drying and canning, also as a garden crop under the name French bean. The plant probably originated in India.

**PEA** (*Pisum sativum*). An annual plant of which many varieties are grown, to mature either early or late in the year; it is cultivated both as a garden and as a field crop.



**BROAD BEAN** (*Vicia faba*). Cultivated in Ancient Egypt and in Europe during the Bronze Age. One of the few kinds of bean that can endure some degrees of frost.



**CHICK PEA** (*Cicer arietinum*). The pod is very short, holding only one or two seeds. Cultivated in India, where the seeds are eaten and called *gram*.



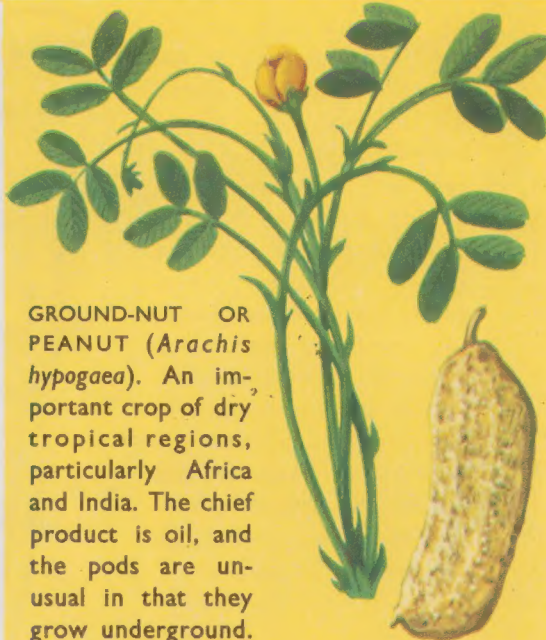
**LENTIL** (*Lens esculenta*). This is the source of the Old Testament 'pulse' and 'pottage'. Today it is an important crop in India.



**CAROB OR LOCUST TREE** (*Ceratonia siliqua*). The leathery brown pods contain a sweet pulp from which sugar can be extracted. These were the 'locusts' eaten by John the Baptist in the desert. The shining brown seeds are not edible but were once used as weights by jewelers, as they are very uniform in size.



**SOYA BEAN** (*Glycine max*). A very important food crop of eastern Asia, grown also in Russia and the United States. The seeds are extremely nutritious and are also the source of a valuable oil. Grows best in a climate with a hot, dry summer.



**GROUND-NUT OR PEANUT** (*Arachis hypogaea*). An important crop of dry tropical regions, particularly Africa and India. The chief product is oil, and the pods are unusual in that they grow underground.

## ORNAMENTAL LEGUMINOSAE

**DYER'S GREENWEED** (*Genista tinctoria*). A yellow-flowered shrub allied to gorse and broom, found as a wild plant in some chalky and sandy-soiled areas in Britain; sometimes grown in gardens. A yellow dye used to be extracted from it.

**WISTARIA** (*Wistaria sinensis*). A climbing perennial plant with woody stems and beautiful hanging sprays of flowers, light purple or sometimes white in colour. It is a native of China and Japan and was only imported into Europe during the 19th century.

**LOCUST OR FALSE ACACIA** (*Robinia pseudoacacia*). A fair-sized tree, a native of eastern North America and introduced to Europe in the 17th century. The flowers are white and borne in hanging sprays. The tree is ornamental but can also yield useful timber and firewood.



**BIRD'S-FOOT TREFOIL** (*Lotus corniculatus*). A common wild flower; the pods are borne in a head which resembles a bird's foot.

**KIDNEY VETCH** (*Anthyllis vulneraria*). A common wild flower found in dry, grassy places and on mountains. The flowers vary from yellow to orange-red, and a white variety is grown in gardens.



## FORAGE PLANTS



**RED CLOVER** (*Trifolium pratense*). Both red and white clover grown in grassland enrich the soil and provide good grazing. Wild and cultivated varieties exist.

**LUCERNE** (*Medicago sativa*). Grows up to 3 feet high and is usually cut to make hay or silage, but, grown with suitable grasses, can also be used for grazing.

**LUPIN** (*Lupinus albus*). This plant is chiefly grown to be ploughed in to enrich poor soils. It is also quite often found growing in gardens.

## LEGUMINOSAE USED IN FLAVOURING



**TAMARIND** (*Tamarindus officinalis*). A tree grown in tropical countries. The fruit is used as a spice and for making beverages.



**LIQUORICE** (*Glycyrrhiza glabra*). Found in southern Europe, chiefly in Spain. The well-known flavouring is extracted from the roots.

# CITIES OF HUNGARY



*Looking across the Danube to Pest from Castle Hill in the centre of Buda. Margaret Island can be seen in the background*

**B**IRMINGHAM and Manchester are two of England's biggest cities – but their combined population is about that of Hungary's largest city, Budapest. This is particularly remarkable, as the population of the next largest city in Hungary is only one-third of that of the moderately sized English city of Bristol. Why is this? First, after the First World War, Hungary was forced to cede two-thirds of her territory, half her population, and many of her towns, including the city of Belgrade (population 587,899). What was left of Hungary was largely an agricultural country, and one colossal city. And the

fact that agriculture plays such a large part in Hungary's economy today is the second reason for the smallness of all other Hungarian towns. The compactness of many Hungarian towns is to a certain extent the result of Hungary's troubled history. During the Middle Ages villages, sometimes fortified with strong walls from which the farmlands radiated, were built. The towns were also compact, and built on easily defended hillsides. It is only in the last century that industry has appeared in Hungary's towns, and they have lost their mediaeval character.



*The five cities of Hungary*

## PÉCS

The most beautifully situated Hungarian city is Pécs (population 115,000), the independent capital of Baranya county. It lies along the vine-clad slopes of the Mecsek mountains, 105 miles south of Budapest. It is also one of the oldest cities, for this was the Roman settlement of *Sopinae*. Stephen, the first king of Hungary (?975–1083), who later became the country's patron saint, began the beautiful cathedral in 1009 and founded the bishopric. The first university in Hungary, and once one of the foremost in Europe, was founded in Pécs in 1367. The mediaeval town centre still stands, laid out in a square with four suburban quarters. During the Turkish occupation (1543–1686) three mosques were built and several churches converted for use by the Muslims.

Pécs's industries include leather processing and wine production, and some of Hungary's most important coal mines are situated there.



*The Houses of Parliament in Budapest, built between 1883*

Budapest is, in fact, made up of two separate towns that united in 1872: Buda on the right bank of the Danube and Pest on the left bank. The many natural hot springs in the area encouraged the Romans to settle in the hills above the Danube. Their town, *Aquincum*, was destroyed by the Huns; but the walled town of Buda was built on the same site by a Germanic tribe in the 13th century, and in 1361 it became the capital of the kingdom of Hungary. Buda's hill-top citadel, connected with the river by a secret supply tunnel, held out against the invading Turks for 15 years after the neighbouring town of Pest had been destroyed in 1526.

Pest was a Magyar trading community built in the 9th century on a former Roman site on the plain. Today it is Hungary's bustling commercial centre. Pest did not recover from the Turkish occupation, which lasted until 1686, until the beginning of the 18th century; then merchants, engineers, and architects from western Europe were invited to the town by Hungary's Habsburg rulers, and Pest soon outstripped Buda in size and importance. In the 19th century interest revived in literature and the arts; a university (founded in 1635)



*The four-towered cathedral of Pécs, begun in the 11th century by St Stephen*

was transferred to Pest and a music academy was opened, of which Liszt was a director. National feeling also grew, resulting in the unsuccessful revolt against Austrian rule in 1848. After Buda and Pest united the city grew more quickly as peasants flocked to the new industries.



and 1902 along the bank of the Danube

### MODERN BUDAPEST

Few historic buildings survived the Second World War, during which Budapest was besieged for 14 weeks by the Russians and almost totally destroyed; the city was later rebuilt, but many buildings were damaged during the revolt against the Russians in 1956.

Budapest is an important river port and railway junction through which the Orient Express passes on its way from Paris to Istanbul. Natural gas is piped to the city from Debrecen, and the hot springs used by the Romans are still famous for their healing properties.

In the river Danube between Buda and Pest lie two completely contrasting islands: the industrialised Csepel Island, with a port and many factories, and Margaret Island, a holiday resort. Here the people of Budapest can relax in large parks and well-planned gardens; there are sports grounds, a fun-fair, a theatre, and a zoo. Horse racing and boating are among the most popular sports. Miniature replicas of some of Budapest's historic buildings can be seen on the island.

### MISKOLC

The second largest city is Miskolc (population 144,000), which stands on the river Sajo between the fertile plain and the thickly wooded Bükk mountains. Miskolc is the capital of the rapidly growing industrial and mining area of Borsod. Its annual trade fairs display the products of the modern iron and steel works, textile mills, and machine shops, as well as those of the nearby farms and vineyards.

Three times in its history Miskolc has been destroyed by fire, and once, in the 13th century, it was razed by the Mongols.

Four miles away to the south-west are the famous warm springs of Tapolcza.



The Calvinist church in the main square of Debrecen, dating from 1803

### DEBRECEN

The historic city of Debrecen (population 129,000) is built on high ground where pastureland, plain, and marsh meet. It has been a market centre since the Middle Ages, and today it is also an important railway junction.

Debrecen has always been an intellectual and religious centre. It was formerly a stronghold of Calvinism, and the University of Arts and Sciences dates back to the 16th century. The revolutionary leader Kossuth made his famous Declaration of Independence here in 1849; the present republic came into being in Debrecen a century later.

### SZEDED

The Magyars built only one town on the plain – Szeged – where the river Tisza and its tributary the Mures meet. It was the Magyars' largest trading community, visited by merchants carrying salt and timber between western Europe and the Adriatic.

Szeged today is an independent city of 99,000 people in the county of Csongrád. It serves as a market centre for the produce of the surrounding

countryside and is an important railway junction. The industries of Szeged include shoe and leather works, food processing plants, and extensive textile mills. The city itself is comparatively modern, for it was almost completely

rebuilt after being devastated by floods in 1879; a double ring of embankments was added as protection against the rivers. The two impressive railway bridges across the Tisza were designed by Eiffel; Cluj University was transferred here in 1921.



The entrance to Cathedral Square, Szeged. The twin towers belong to the cathedral, built in 1924

# THE CRIMEAN WAR



*'Magnificent, but not war.' A ghastly mistake sends the Light Brigade charging to certain death on the field of Balaklava*

ONE of the most famous puns in the English language was made about the Crimean War. 'The Crimea,' said the 19th-century politician, John Bright, 'was a crime.' His attitude is shared by many historians. They claim that the war came about by blundering diplomacy; that it was fought without any real object; that it was appallingly mismanaged; and that its peace terms produced a far more dangerous political situation than had existed before.

How then could such a pointless war come about, and was it really as absurd as many people think?

In the mid-19th century statesmen were very concerned with the Eastern Question. This was basically very simple. Turkey had once been a great power, but she was now in decline. Yet she had a vast empire spanning Asia and Europe and including the vital city of Constantinople. Many of her subject lands were uneasy about the harsh, ineffectual rule of the Turks and were ready to revolt for their independence. The Greeks had already attained independence in 1833.

British statesmen were afraid that Russia would control, or perhaps even annex, the feeble states which might gain independence from the Turks. The British therefore supported the idea of a strong Turkey, and distrusted the Russians. Out of this distrust came the Crimean War, and all its heroism, folly, mismanagement, and suffering.

## The ambitions of France

But this situation had existed for a generation before the war; it was the accession of the ambitious Louis Napoleon on 2nd December 1852 that precipitated the conflict.

The vital issue had been raised by Louis Napoleon in May 1850 when he was President of France. This was the squabble over the 'Holy Places': whether the Roman Catholic monks or Orthodox Christians should have the custody of the Holy Places around Jerusalem which were owned by the Muslim Turks. The claims of the Orthodox Christians were obviously

supported by Tsar Nicholas I of Russia; those of the Latin monks by the Emperor of Catholic France. Historians rightly condemn a war which sprang out of such a silly row.

Yet the matter was complicated for a number of reasons. The first was the presence in Constantinople of the British Ambassador, Lord Stratford de Redcliffe. Lord Stratford, who was violently anti-Russian, urged the Turks to resist Russian demands on behalf of the Orthodox Church, and promised them British support. And the British government became increasingly suspicious after Tsar Nicholas openly advocated splitting the Turkish Empire, calling it a 'sick man'.

Another complication was that the Russians backed their claims with the Treaty of Kutchuk Kainardji (1774) which they claimed gave them general protection over all the Sultan's Christian subjects – a move with dangerous political implications. But if Russia controlled the Black Sea she might extend her influence into the Mediterranean and threaten vital British and French interests and the route to India. The Tsar, not perhaps realising the effect his actions would have on the British and French, occupied the Principalities of Moldavia and Wallachia (the present Romania) on 21st July 1853, until the Turks should concede the treaty rights Russia demanded. Last-minute efforts were made to avert war. The Vienna Note (31st July), circulated by neutral Austria, was signed by all the powers, but amended by the Russians in such a way that it was unacceptable to the Turks. Encouraged by Lord Stratford, they declared war on 23rd October 1853.

## The war

The opening weeks saw little serious fighting, but on 30th November the Russians destroyed the Turkish fleet in the Bay of Sinope. At once a war party in the British government urged intervention, and on 4th January 1854 the English and French fleets entered the Black Sea. The British Prime Minister, Lord Aberdeen, still hoped to avert war, though Napoleon III was

more bellicose. Russia rejected all demands made on her, and by 28th March Britain and France were at war, though grievously disappointed not to have Austria and Prussia (who remained neutral) fighting by their sides.

The war was a military rather than a naval one. The British army under Lord Raglan was 28,000 strong; the French under Marshal Saint Arnaud was slightly larger.

The opening campaigns were basically sieges punctuated by desultory fighting. In the summer Russia decided to evacuate the Principalities and by the first week of August she had done so. Now came the dilemma. War had been declared, but where was it to be fought? The allies chose to attack the arsenal at Sevastopol, in the Crimea. On 14th September 50,000 British and French troops landed to the north of the town. Their equipment was badly prepared. Much had to be left behind for lack of transport, including tents and clothing. But they were a fine army as they began their march down towards Sevastopol. On 20th September the Russians, under Prince Menshikov, tried to stop them. In the resulting battle of Alma the Russians were routed, though allied casualties amounted to several thousand.

The allies were hampered by dissensions between the impetuous Lord Raglan and the more cautious Saint Arnaud. The result was that the allies prepared to besiege the city, and so offered a vulnerable target whenever the Russians decided to attack. On 25th October the armies came face to face at Balaklava, and in that battle came one of the greatest and most tragic episodes not only of the Crimean War but of all military history. Misunderstanding an order given to him, the cavalry leader, Lord Lucan, ordered the 607 men of the Light Brigade, under his own brother-in-law Lord Cardigan, to assault an impregnable and heavily fortified Russian position. It was tantamount to suicide and only 198 survived. A French commander, witnessing the heroic but futile charge, made the immortal remark: 'C'est magnifique, mais ce n'est pas la guerre.' The battle of Balaklava resulted in a partial victory for the allies in so far as they were not driven back from their position outside Sevastopol. Yet this and the battle of Inkerman on 5th November, though technically a defeat for the Russians, caused heavy losses to the allies.

But the greatest hardships came after Inkerman with the onset of the terrible Crimean winter. Badly fed, badly clothed, the small force outside Sevastopol suffered dreadfully in the winter of 1854–1855. No fewer than 9,000 died of disease, while in February 1855 13,000 men were in hospital, and some hospitals like Scutari were so bad that half the men died from sheer lack of attention. Yet out of this misery was born proper care of war wounded, for in October Florence Nightingale (see page 116) had arrived – she was eventually to instil new standards of hospital efficiency.

Soon there were changes on the home front too, for in February 1855 Lord Palmerston (see page 2540) became Prime Minister. Under his firm hand the war was conducted, both at home and on the front, far more efficiently. Equally encouraging, Sardinia had joined the allies in January 1855 (see page 1905), and on 2nd March Tsar Nicholas died.

The new Tsar, Alexander II, did not bring about immediate peace. Yet slowly the allies got the upper hand, and the Russians became dispirited. Even the death of Lord Raglan on 28th June made little difference. At last, on 8th September, Sevastopol was taken, due largely to a brilliant though costly attack by the French.

### A harsh peace

The military historian finds little to interest him in the Crimean War – but not so the diplomatic historian, for in this period the 'Eastern Question' reached a high-water mark. Yet the terms imposed on Russia by the Peace of Paris were much too severe to solve that Question. These terms accepted Turkey as a great and independent power (which she was not), and denied Russia the right of protection over the Principalities. They forbade arsenals and military bases on the Black Sea, which were really vital to Russia's role as a great and expanding power.

Britain's faith in Turkey proved to be misplaced. She had no capacity to reform, balance her budget, or to rule her empire effectively, wisely, or even humanely. At the close of the century Lord Salisbury was to make one of diplomacy's classic remarks when referring to the Crimean War: 'In favouring Turkey,' he said, 'we put our money on the wrong horse.'

*Hand-to-hand fighting at Inkerman (Russians on right) – fought in fog and confusion, it became known as 'the soldiers' battle' [based on a contemporary drawing]*

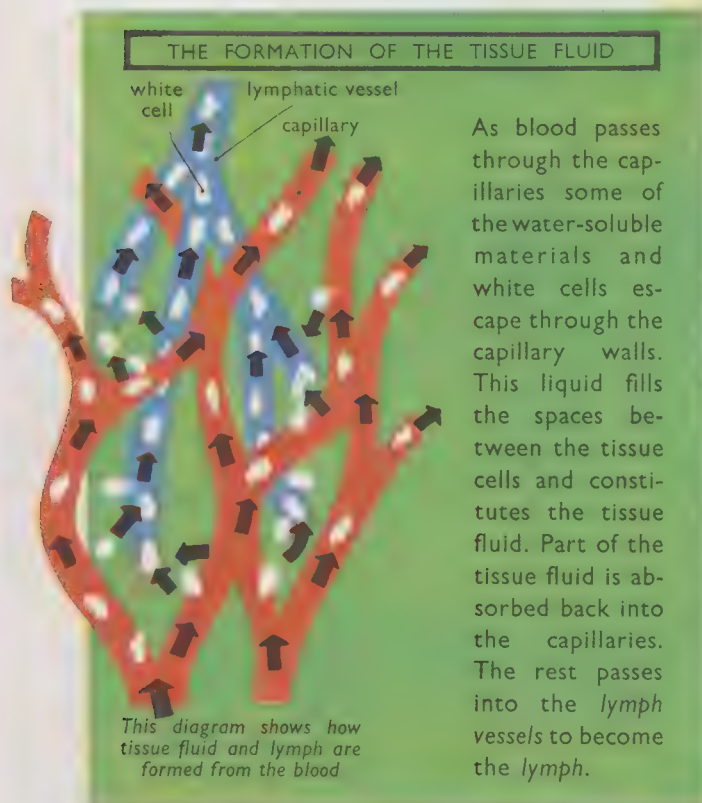


# THE LYMPHATIC SYSTEM

**T**HE function of the blood is to carry oxygen and nutrients to the cells of the body tissues, and to carry away from the cells carbon dioxide and unwanted nitrogenous waste. This seems relatively simple, until we study more closely the processes by which substances are transferred from the blood to the tissue cells and from the cells to the blood.

One obvious complication is that the blood only comes into direct contact with the cells in the spleen and the liver. In all other parts of the body the blood remains strictly within the blood vessels. There must therefore be some intermediate substance to carry material from blood to cells and from cells to blood. This substance is the *tissue fluid*.

The amount of tissue fluid in the body is quite large. However, since it is distributed in very small amounts around the cells in all parts of the body it is very difficult to observe. It is even more difficult for scientists to obtain any of it to study. It is thought, however, that it is much like *plasma* (the watery part of the blood) in composition except that it contains no protein.

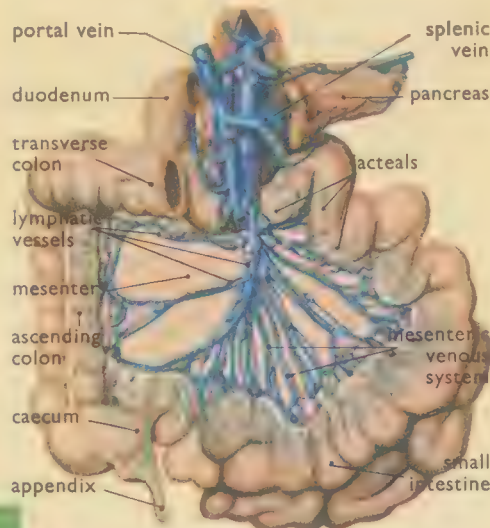


As blood passes through the capillaries some of the water-soluble materials and white cells escape through the capillary walls. This liquid fills the spaces between the tissue cells and constitutes the tissue fluid. Part of the tissue fluid is absorbed back into the capillaries. The rest passes into the lymph vessels to become the lymph.

## THE LYMPHATIC CIRCULATION

Because blood flows through the capillaries all the time the formation of lymph is continuous. A large volume of it passes along the network of lymphatic vessels until it reaches the main lymph vessels which conduct it from the whole of the body back to the blood-stream. The lymph becomes part of the blood plasma and returns to the capillaries to complete the circulation.

*The lymphatic vessels in the mesentery carry the chyle from the lacteals to the cisterna chyli*



## THE LACTEALS

The usual function of the lymphatics is to carry lymph from the tissues back to the blood-stream, but the great network of lymphatic vessels which serves the intestines also transports nutrient substances from the food.

During digestion the small molecules into which food is broken down find their way into the millions of tiny villi which line the interior of the intestinal wall. Some of these food molecules are carried away in the blood-stream, but others, particularly fats, enter the tiny lymphatic vessels, the *lacteals*, one of which lies in the centre of each villus.

The mixture of lymph and nutrients, known as the *chyle*, is carried by the lacteals to lymph vessels in the intestinal wall. It is then collected into the larger vessels which course

through the mesentery and is carried to the cisterna chyli.

## THE CISTERNA CHYLI

The cisterna chyli is an irregularly shaped chamber about 2½ inches long and about 1 inch wide which lies on the rear wall of the abdominal cavity. The *intestinal lymph trunk* which carries the lymph from the intestines, and the *left and right lumbar trunks* which carry lymph from the lower limbs and the pelvis, lead into it. At its upper end it narrows to form the lower end of the *thoracic duct*.

## THE THORACIC DUCT

The thoracic duct carries the mixture of lymph and chyle from the cisterna chyli upwards through the thorax to the left subclavian vein in the root of the neck. It is the largest lymph vessel in the body, being about 16 inches long and ¼ inch wide.

Changes in pressure in the body, associated with breathing, cause the lymph to move up the thoracic duct, which is provided with several valves to prevent the fluid from flowing downwards.

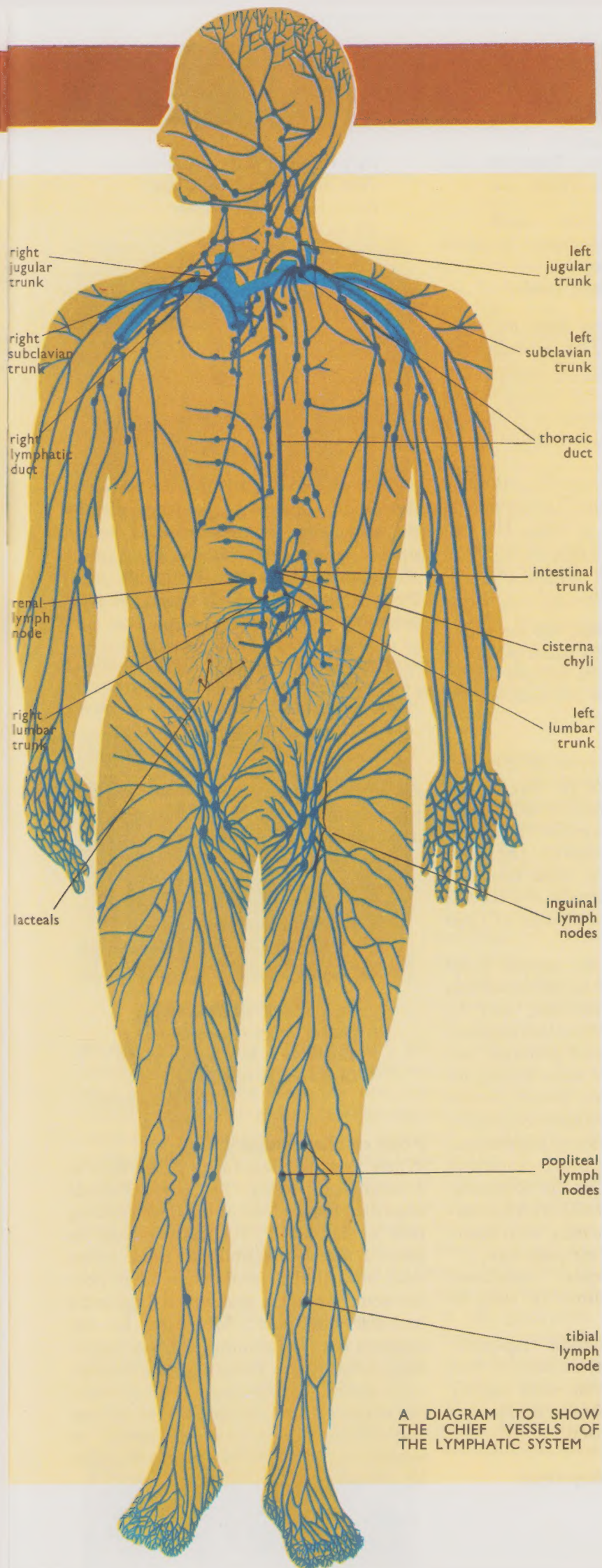
Just before the thoracic duct enters the subclavian vein it is joined by the *left jugular* and *subclavian trunks* carrying lymph from the left side of the head and neck and the left arm.

## THE RIGHT LYMPHATIC DUCT

The lymph from the right side of the head and neck is collected into the *right jugular trunk*, while that from the right arm flows into the *right subclavian trunk*. These vessels unite to form the *right lymphatic duct* which carries the lymph to the right subclavian vein.

■ area draining into the right lymphatic duct  
■ area draining into the thoracic duct



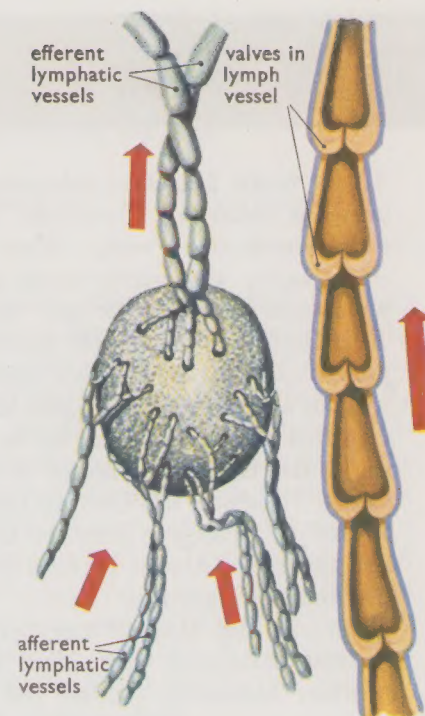


## The lymph nodes

The lymph vessels which drain the lymph from the tissues do not run directly to the large lymph vessels, but are interrupted in their courses by small organs known as *lymph nodes*. These lymph nodes are the 'glands' which can often be felt under the skin. Their function is to filter the lymph, removing from it any dangerous microbes which may have found their way through the skin or the intestinal wall and into the tissue spaces.

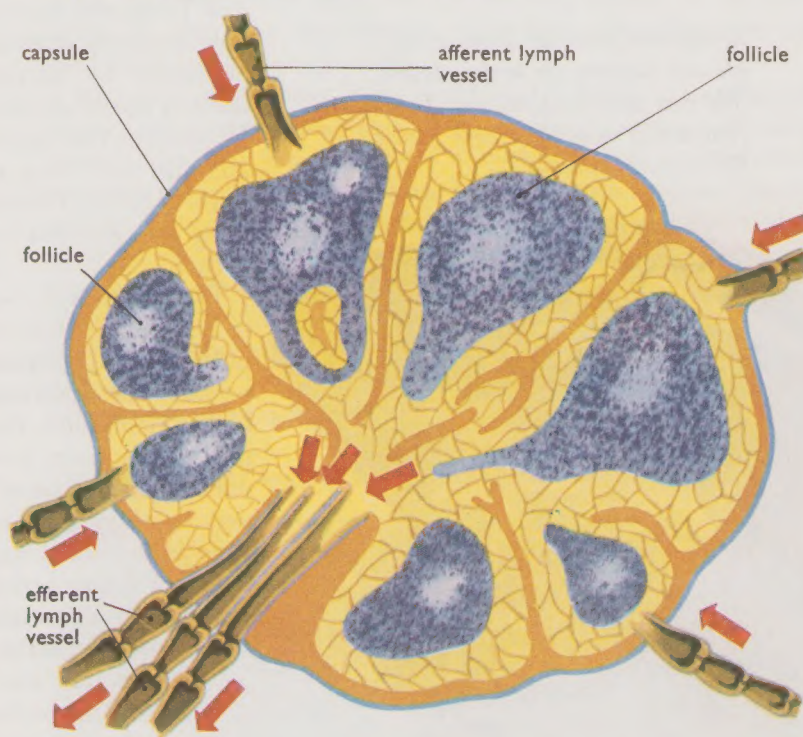
In most cases several *afferent* lymph vessels carry lymph into the outer part of each lymph node. The lymph passes through the node and is carried away from it in one or more *efferent* lymph vessels, and on to the next node. And so the lymph makes its way by steps to the thoracic duct or the right lymphatic duct.

The lymph vessels which carry the lymph from node



*A lymph node and a section of a lymph vessel*

to node are extremely thin-walled and delicate. Externally they have a beaded appearance. This is, in fact, caused by the presence within of minute one-way valves.



*Section through a lymph node showing the arrangement of the vessels*

Each lymph node has a fibrous envelope or *capsule* from which trabeculae extend inwards; within it lie the *cortex* formed of *lymph follicles* and, in the centre of the gland, the irregular lymphoid masses of the *medulla*. Lymph *sinuses* honeycomb the gland, carrying the lymph towards the efferent lymphatics.

'BYRON IS DEAD' – solemnly the 15-year-old Alfred Tennyson engraved these words on a rock. 'That day,' he wrote later, 'the whole world seemed to have been darkened for me.' Even at 15 Tennyson was completely involved with poetry – indeed three years before he had written an epic poem of 6,000 lines.

Alfred Tennyson grew up in Lincolnshire. His father was rector of Somersby where Tennyson was born in 1809. At the age of 19 Tennyson went to Cambridge and there met Arthur Hallam who was to become his greatest friend. In 1830 Tennyson and Hallam together joined a Spanish insurgent army and spent the summer marching around the Pyrenees without ever encountering an enemy. In this period Tennyson was already writing accomplished poetry like *The Lotos Eaters* and the much-quoted *Lady of Shalott*. The latter is one of the best poems of its kind in our language. It is full of stirring passages like the one in which Tennyson evokes all the glitter, excitement, and vigour of the Red Cross Knight riding through the fields of barley:

*'A bow-shot from her bower-eaves,  
He rode between the barley-sheaves,  
The sun came dazzling thro' the leaves,  
And flamed upon the brazen greaves  
Of bold Sir Lancelot.'*

In 1833 Hallam died. Tennyson was completely desolate. He wrote:

*'And all the phantom, Nature, stands –  
With all the music in her tone,  
A hollow echo of my own, –  
A hollow form with empty hands.'*

These lines are taken from his great poem *In Memoriam*. This recorded his feelings after the death of Hallam, his complete despair, his returning faith in Christianity and the goodness of human beings, and finally the restoration of his happiness.

*In Memoriam* was not actually published until 1850. By this time Tennyson was already established as a poet. He had published famous poems like the sonorous *Morte d'Arthur* and *The Princess* with its many beautiful lines like:

*'Now sleeps the crimson petal, now the white;  
Nor waves the cypress in the palace walk;  
Nor winks the gold fin in the porphyry font:  
The fire-fly wakens: waken thou with me.'*

## Poverty

Yet Tennyson found himself in considerable financial difficulties. In 1842 he was persuaded by 'an earnest – frothy' speculator to invest all his money in The Patent Decorative Carving Company. He lost it all, and was only saved from complete poverty by the Prime Minister, Sir Robert Peel, who granted him a pension of £200 a year.

1850, however, was the turning point of his life. In that year *In Memoriam* was published, Tennyson married, and he became Poet Laureate. After this appointment Tennyson's financial situation improved, for more people were buying his poems. His output of great poetry continued. In 1855 *Maud* was published, and in 1859 *Idylls of the King*, tales of knights and ladies of King Arthur's court. Tennyson was greatly influenced by the Romantic Movement and its fascination with Arthurian legends. He was friendly with many of the Pre-Raphaelites (see page 2327).

The stream of poetry continued throughout Tennyson's life. In 1884 he was made a baron.

Not all his poetry is good – especially some written because of his post of Poet Laureate. Some of it may seem slightly heavy-handed like his *Ode on the Death of the Duke of Wellington*:

*'Bury the Great Duke  
With an empire's lamentation,  
Let us bury the Great Duke  
To the noise of the mourning of a  
mighty nation.'*

Some of it is 'good rollicking stuff' like *The Charge of the Light Brigade* and *The Revenge*. From the latter:

*'Sink me the ship, Master Gunner – sink  
her, split her in twain!  
Fall into the hands of God, not into the  
hands of Spain!'*

There is, in fact, in Tennyson's poetry the sublime, mediocre, and occasionally the ridiculous. Sometimes it is heavy, stilted, over-ornate – almost like a piece of Victorian furniture. But quite often there are passages which evoke the most poignant atmospheres:

*'The woods decay, the woods decay and fall,  
The vapours weep their burthen to the ground,  
Man comes and tills the field and lies beneath,  
And after many a summer dies the swan.'*  
(*Tithonus*)

Another of Tennyson's poetic qualities was his ability to express noble sentiments in the noblest of fashions:

*'I envy not in any moods  
The captive void of noble rage,  
The linnet born within the cage,  
That never knew the summer woods:*

*.....*  
*I hold it true, whate'er befall;  
I feel it, when I sorrow most;  
'Tis better to have loved and lost  
Than never to have loved at all.'*  
(*In Memoriam*)

## Poet of the century

When Tennyson was in his prime he was a magnificent figure. The writer Carlyle described him as 'one of the finest-looking men in the world'. He was certainly the poet of the 19th century in more senses than one. In his heyday no other poet detracted from his position as England's 'number one poet'. Moreover, his life spanned the 19th century. He was born a few years before Waterloo and died in 1892. Much that was good in the cultural life of the century, its nobility of feelings and willingness to express them, its romanticism, and its lyricism, is found in his poems.

◀ Lord Tennyson (1809–1892)



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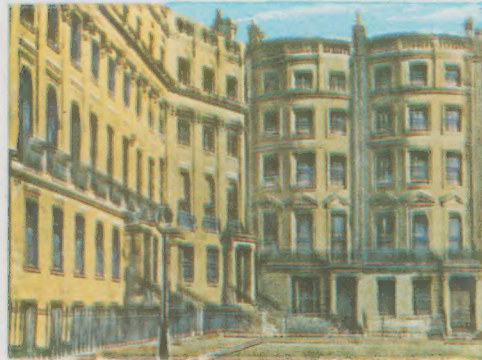
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*Georgian houses in Hampstead*

lours, and bedrooms. Open fires gave way to closed kitchen ranges, and, as glass was now cheaper, windows, made of a number of small diamond panes embedded in lead, became larger. Interiors too became more elaborate (see **Furniture**). In the Elizabethan period many of the larger houses were built, in part at least, of brick; and the exuberant spirit of the age shows in such mansions, with their flamboyant decoration, gables, and clusters of elaborate chimneys.

session of castles became a royal prerogative. Trade increased, and the new professional classes had time and money to spend on their houses. Manor houses were now built for comfort, not as strongholds. They no longer consisted of one great hall, but had separate dining rooms, par-



*A Regency square in Hove*

greatly influenced by 'Palladianism', and by the time of the Restoration this style had taken firm root in England. In contrast with the Tudor house this new, 'classical' house appeared severely simple. Its general outline was rectangular and symmetrical; ornamentation was restrained – pediments (see **Architecture**) and pillars often formed the façade.

The outstanding architects of the late 17th and early 18th centuries were: Sir Christopher Wren, who played an influential part in planning a more spacious London after the Great Fire in 1666; his pupil, Nicholas Hawksmore, and John Vanbrugh whose Castle Howard and Blenheim Palace are two of the greatest 18th-

### Classicism

But this exuberance was checked early in the 17th century. In Italy an architect called Palladio had been basing his designs on the classical buildings of Greece and Rome.

Inigo Jones, an architect at the court of James I, was

century houses. But as the prosperity of Britain increased, so too did the number of people who could afford to live in properly built, though not luxurious, houses.

These middle-class houses, which often represented the best architecture of the period, were smaller than the great mansions of the past. They were usually built of brick with tiled roofs and high sash windows; the central front door was often beautifully panelled and surrounded by moulded stone architraves. This fashion for simple, elegant houses continued throughout the reigns of Queen Anne and the four Georges; and in the Georgian period town houses began to be built in terraces in which a number of houses were united by a common façade. Towards the end of the century classical ideas were brought once more to the fore by the Adam brothers, and this style reached its peak in the early 19th century with such buildings as John Nash's gracious crescents of Regent's Park and Regent Street. In this Regency period brick houses were often faced in stone.

### Victorian and modern

Queen Victoria's reign saw no completely new style in English houses, which tended to be large, dark, and over-ornate. Victorian builders often copied past styles; thus we find romantic 'mediaeval' turrets, 'tudor' gables, and pointed 'gothic' windows. In the 19th century people began to crowd to the towns to work in the new factories, and as the centres of these industrial towns became smoky and unpleasant, so some people began to leave them, and they, like many of the workers, settled in the outskirts. In this way the suburbs, with their sprawling rows of semi-detached villas, were born.

Recently efforts have been concentrated both on coming to terms with overcrowding as well as on experimenting with new house styles. The widespread use of such materials as reinforced concrete, steel, and plate glass has helped in both spheres. Blocks of flats, 20 or more storeys high, are springing up in overcrowded areas, while 'new towns', housing estates, and garden cities are developing. Among new experiments are those using strengthened glass to allow vast windows; also 'split level' and 'open plan' interiors are becoming popular. But perhaps most noticeable of all is simply the growth of modern amenities like central heating, lifts, and lighting incorporated into house design.

*Part of a modern housing estate, planned around gardens and trees*



*Victorian houses in Kensington*



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# Knowledge

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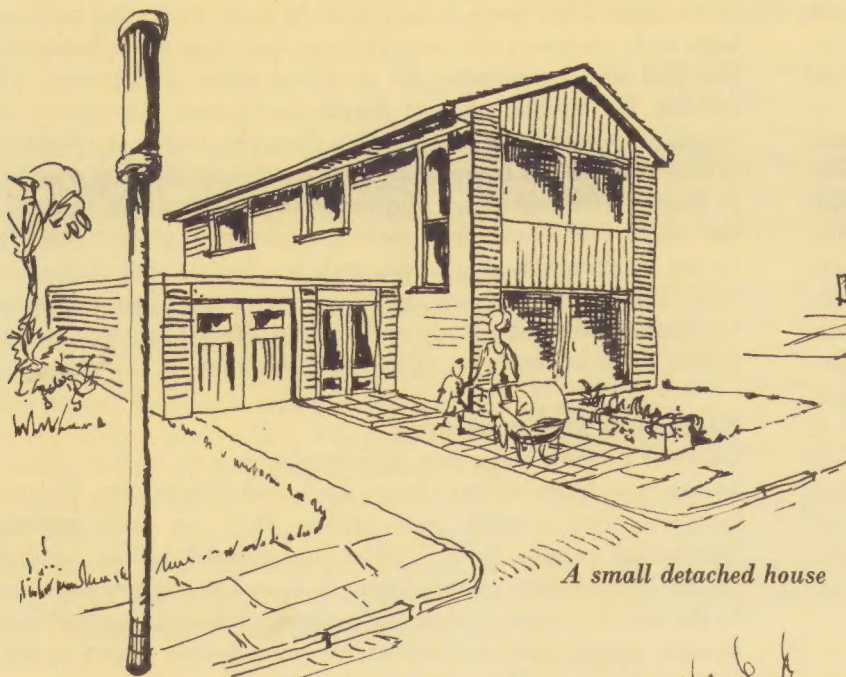
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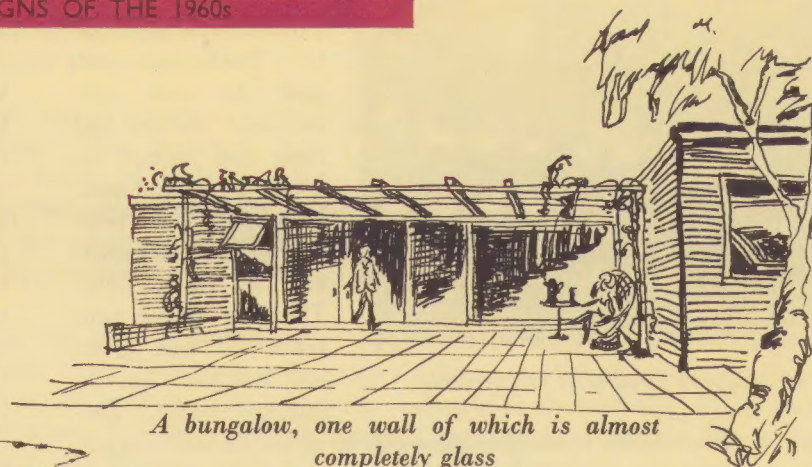
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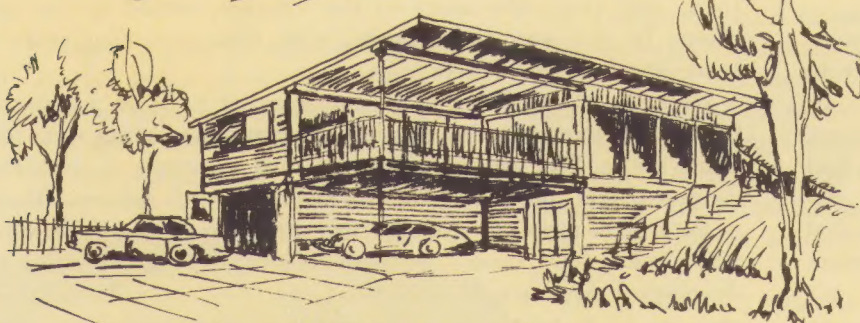
## FIVE DESIGNS OF THE 1960s



*A small detached house*

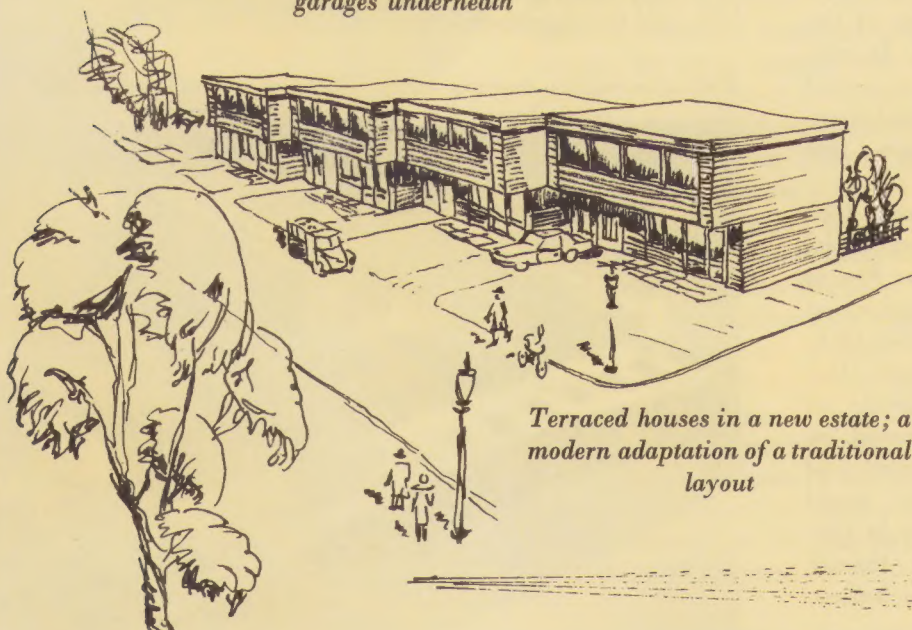
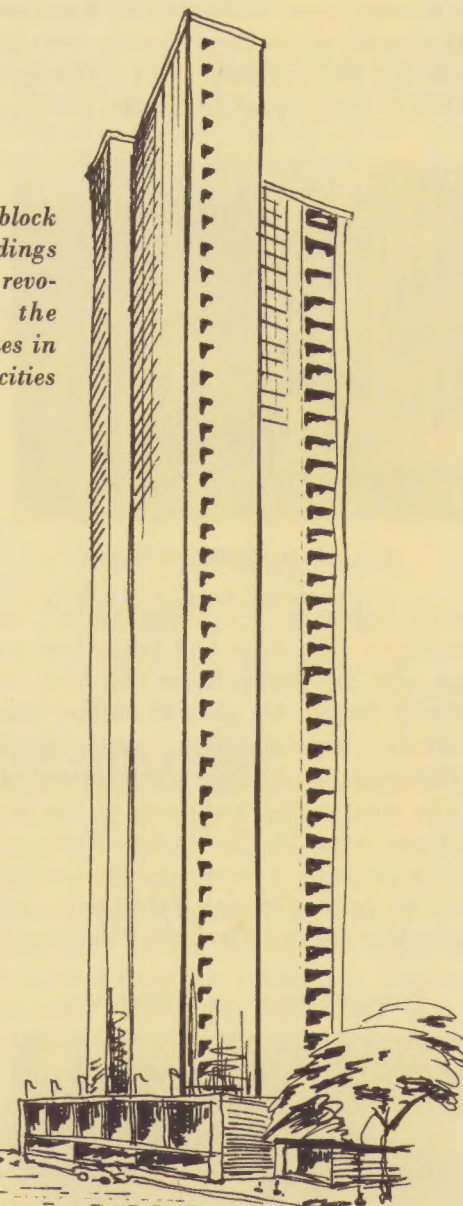


*A bungalow, one wall of which is almost completely glass*



*A house with living accommodation on the first floor, and storage space and garages underneath*

*A skyscraper block of flats; buildings like these are revolutionising the familiar skylines in many British cities*



*Terraced houses in a new estate; a modern adaptation of a traditional layout*